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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,029	07/22/2003	Massimo Grasso	2-2546	9534

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EXAMINER	
NGUYEN, HIEP	
ART UNIT	**PAPER NUMBER**
2816	

DATE MAILED: 05/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding..

Office Action Summary	Application No.	Applicant(s)	
	10/625,029	GRASSO ET AL.	
	Examiner	Art Unit	
	Hiep Nguyen	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5,7 and 14-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,7 and 14-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed on 03-14-05 has been received and entered in the case. New ground of rejections necessitated by the amendment is set forth below.

Specification

The disclosure is objected to because of the following informalities: formula (1) is not correct because it only make sense when resistors (12) and (14) are in parallel. According to figures 1 and 2 of the present application, these two resistors are not considered to be connected in parallel because they are separated by a buffer.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1,3, 5, 7 and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Correction and/or clarification is required.

Regarding claim 1, the recitation " a biasing voltage **in** the voltage buffer" on line 6 is indefinite because it is misdescriptive. The voltage bias source (20) in figure (20) is outside of buffer (22). The recitation "wherein the biasing voltage produces a **reference current value** through **the sense resistor** such that **a sensed current** through **the sense resistor** comprises both the divided current from the current path and the reference current value; wherein a measurement of **the divided current** through **the sense resistor** is obtained by subtracting the reference current value from the sensed current; and wherein a current flowing through the shunt resistor is determined based on the obtained **divided current** through the **sense resistor** and the gain relationship" is confusing and does not make sense because there are **three different currents** flowing through **the sense resistor.** Figures 1 and 2 of the present application shows that the sense resistor (14) and the shunt resistor (12) **each** has a **separate current** flowing through. Clear explanation is required. The Applicant is requested to point

out in the drawing the "reference current", the "sensed current" and the "divided current" which flow through the sense resistor (14). Note that according to figures 1 and 2 of the present application there are only two currents that are the current flowing through the shunt resistor (12) and the current flowing through the sense resistor (14) when transistor (24) is turned on by the voltage source (20). These currents cannot be isolated, measured, subtracted or stored because there are no circuit or devices for performing these operations.

Regarding claim 7, the recitation " wherein the reference current value is stored" in indefinite because it is not clear what it is meant by. The Applicant is requested to explain how the "reference current value" that does not exist can be stored.

Regarding claim 14, the recitation "providing a sense resistor coupled to the shunt resistor to obtain a current divider circuit, wherein a resistance value for the sense resistor is selected based on a range of current in the wire, the shunt resistor and the sense resistor establishing a desired relationship; applying a bias voltage between the shunt resistor and the sense resistor, the biasing voltage producing **a reference current** value through the **sense resistor**; **measuring current** flow through the **sense resistor (current Ise)**, the **measured current** flow **comprising both divided current from the wire and the reference current value**; subtracting the reference current value from the measured current flow through the sense resistor to obtain a measurement of the divided current through the sense resistor; and determining current flowing through the shunt resistor based on the obtained divided current through the sense resistor and the desired relationship between the shunt resistor and the sense resistor" is indefinite because it is confusing. The **reference current** is the current flowing through the **sense resistor (14)**. The **measured current** is also the current flowing through **the sense resistor (14).** It is not clear how this "measured current" (Ise) can comprise **both divided current from the wire (Ish) and the reference current value (Ise).** The Applicant is requested to clarify what are the "a reference current", "measured current", "divided current" and to explain how the "**measured current** flow (Ise) **comprising both divided current from the wire (Ish) and the reference current value (Ise)**. Note that the "reference current' does not exist because there is no current flowing from bias source 20 to resistor (14).

The recitation "**measuring current** flow through the **sense resistor (current Ise)**, the **measured current** flow **comprising both divided current from the wire and the reference**

current value; subtracting the reference current value from the measured current flow through the sense resistor to obtain a measurement of the divided current through the sense resistor; and determining current flowing through the shunt resistor based on the obtained divided current through the sense resistor and the desired relationship between the shunt resistor and the sense resistor" is indefinite because it is misdescriptive. Figures 1 and 2 of the present application show **no device/circuit that can measure, subtract and determine the current flow as recited**. Note that it is not clear what are the divided current and the reference current. There is only one type of current flowing through resistor (14) when transistor (24) is turned on by the bias source and op-amp (24). No separate "divided current" and "reference current" are seen.

Claims 3, 5, 15 and 16 are indefinite because of the technical deficiencies of claims 1 and 14.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 7 and 14-16 are rejected under 35 U.S.C. 102 (b) as being anticipated by Barbetta (US 6,414,549).

Regarding claims 1 and 3, figure 8 of Barbetta shows sense circuit comprising: a shunt resistor (142), a sense resistor (134), a voltage buffer (132), a bias voltage (136) producing a reference current flowing through the sense resistor (134). The value of the sense resistor (142) determines the value of voltage (Vref) i.e., the current flowing through the sense resistor (134). Thus, there is a relationship between the value of the sense current and the shunt current. The direction of the current flowing through the sense resistor is constant (from V+ to output).

Regarding claim 7, the "reference current value" flowing through resistor (144) is fixed (stored).

Regarding claims 14-16, figure 8 of Barbetta shows a method for sensing current in a wire wherein the sense resistor is resistor (134), the shunt resistor is resistor (142), the bias voltage is (136) the voltage flowing through the sense resistor can be measured by measuring the voltage across the sense resistor. The "reference current value flowing through resistor (1440 can be calculated and can be subtracted from the "measured current". Because there is a relationship between the shunt resistor (142) and the sense resistor (134), the value of the current flowing through the shunt resistor can determined. The bias voltage (136) is a DC voltage thus, the current flowing through the sense resistor is in one direction.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Regarding claim 5, it is well known to one skilled in the art that the ratio of thermal coefficients of the resistors is selected to be equal approximately to one for equal variation of the resistors with respect to the temperature to keep the ratio of current values flowing through the resistors equal.

Response to Arguments

In the Remarks, page 10, 2nd paragraph, the Applicant explains that "This bias voltage 20 produces a "reference current value"(or base value) through the sense resistor 14" and "According to the invention, this reference current value is isolated /determined and stored". This explanation is misleading for the following reason:

a. the reference current value does not exist because there is no current flowing from element (20) to ground through the sense resistor (14). The input impedance of an op-amp is extremely high thus, there is no current flowing from element (20) through resistor (14).

b. since the "reference current value" does not exist, it cannot be isolated/determined and stored. Moreover, there is no devices/circuits seen to be able to isolate, determine, measure and store the "reference current value".

On lines 9-12, the Applicant explains that "the sense resistor and the shunt resistor of present invention are connected in parallel. Hence, while each resistor is on a separate path, these two paths are connected such that the current entering their common points of joinder (i.e., the square blocks) is divided between the two paths. In other words, the two resistors are connected in parallel and thereby form a divider circuit, as claims 1 and 14 recite.". This explanation is misleading because figures 1 and 2 of the present application show that there are buffer and voltage source coupled between the square blocks thus, the two square blocks cannot be connected together (common points of joinder).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hiep Nguyen whose telephone number is (571) 272-1752. The examiner can normally be reached on Monday to Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on (571) 272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hiep Nguyen
17-05-05

TUAN T. LAM
PRIMARY EXAMINER